Appendix C

Rule Fact Sheets/Quick Reference Guide

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Fact Sheet: Long Term 1 Enhanced Surface Water Treatment Rule

The Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) will improve public health protection by reducing the risk of exposure to* Cryptosporidium *in systems serving fewer than 10,000 people even as those systems begin to take steps to comply with related Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR) requirements. The LT1ESWTR utilizes the same framework as the Interim Enhanced Surface Water Treatment Rule (IESWTR), which applies to systems serving 10,000 or more people.

IS YOUR PWS AFFECTED?

Your PWS must comply with the LT1ESWTR if it is a surface water system or ground water under the direct influence of surface water (GWUDI) system (together referred to as a Subpart H system) and serves fewer than 10,000 people.

WHAT DOES THE LT1ESWTR REQUIRE?

❑ **Control of *Cryptosporidium*.**

- ✓ Systems required to filter must achieve a 2-log (99%) removal of *Cryptosporidium* by meeting combined filter effluent (CFE) turbidity limits based on the type of filtration used.
- ✓ Systems using conventional or direct filtration must conduct continuous monitoring of individual filter effluent (IFE) and record results at least every 15 minutes.
- ✓ Unfiltered systems must include *Cryptosporidium* in their watershed control programs.
- ✓ *Cryptosporidium* is included in the definition of GWUDI.

❑ **Disinfection profiling for community and non-transient non-community systems, unless the State determines profiling is unnecessary.**

❑ **Disinfection benchmarking must be performed if a system is considering a significant change to their disinfection practice and was required to develop a disinfection profile.**

❑ **The State must approve any significant changes to disinfection practices before they are made.**

❑ **The construction of new uncovered finished water storage reservoirs which begins on or after March 15, 2002 is prohibited.**

What are the new combined filter effluent (CFE) turbidity requirements?

By January 14, 2005:

If your system uses conventional filtration or direct filtration treatment:

- ✓ Your system must monitor and record the CFE turbidity at least every 4 hours. This frequency may be reduced by the State to once per day for systems serving 500 or fewer persons.
- ✓ Your system's CFE must be less than or equal to 0.3 Nephelometric Turbidity Units (NTU) in 95% of the readings taken each month, and must not exceed a maximum turbidity value of 1 NTU at any time.

If your system uses slow sand filtration or diatomaceous earth filtration you must continue to meet the requirements established in the 1989 Surface Water Treatment Rule (SWTR).

- ✓ Your system is considered to achieve at least 2-log (99%) removal of *Cryptosporidium* if you continue to meet the existing filter performance requirements in the SWTR:
  - Monitor and record the CFE at least every 4 hours unless the frequency is reduced to once per day by the State for slow sand systems or for diatomaceous earth systems serving 500 or fewer persons.
  - Your system's CFE must be less than or equal to 1 NTU in 95% of the readings taking each month, and must not exceed a maximum turbidity value of 5 NTU.

If your system uses alternative filtration technologies (other than conventional, direct, slow sand, or diatomaceous earth filtration):

- ✓ You must monitor and record the CFE turbidity at least every 4 hours. This frequency may be reduced by the State to once per day.
- ✓ Your system must comply with the State set turbidity limit for 95% of the monthly readings. This limit (not to exceed 1 NTU) is based on a demonstration that your system's method of filtration achieves at least 2-log (99%) *Cryptosporidium* removal as well as 3-log (99.9%) *Giardia lamblia* removal and/or inactivation, and 4-log (99.99%) virus removal and/or inactivation.
- ✓ Your system must comply with the State set maximum turbidity value (not to exceed 5 NTU) based on the demonstration data.

✍ ***For All Filtered Systems**, the following CFE information must be reported to the State by the 10th of the following month:*

- ✓ The total number of CFE turbidity measurements taken during the month.
- ✓ The number and percentage of CFE turbidity measurements taken during the month which are less than or equal to your system's required 95th percentile limit.
- ✓ The date and value of any CFE turbidity measurements taken during the month which exceed the maximum turbidity value for your system. (Note: any exceedance of the maximum allowable turbidity limit must be reported to the State within 24 hours in accordance with the Public Notification Rule.)

What are the new individual filter effluent (IFE) monitoring requirements?

By January 14, 2005:

If your system uses conventional filtration or direct filtration treatment you must:

- ✓ Conduct continuous monitoring of IFE turbidity and record turbidity values at least every 15 minutes. If your system has two filters, you can continuously monitor the CFE instead of monitoring each individual filter. Systems with one filter must monitor the filter effluent continuously.

- ✓ Implement follow-up action if the turbidity of an individual filter--or CFE if continuously monitored for systems with two or fewer filters--exceeds 1.0 NTU in 2 consecutive readings. See table below.

✍ *The following IFE information must be reported to the State by the 10th of the following month:*

- ✓ Confirmation that your system conducted IFE turbidity monitoring during the month.

- ✓ Information on IFE follow-up actions indicated in the table below.

Individual Filter Effluent Follow-up Actions		
If the IFE turbidity at the same filter* is:	**Then:**	
> 1.0 NTU in 2 consecutive recordings 15 minutes apart:	✍ Report the filter numbers(s), date(s), turbidity value(s), and cause (if known) to the State by the 10th of the following month.	
If a system has a repeat exceedance:	**Then, in addition to reporting to the State the information regarding the initial exceedance above, the system must:**	
> 1.0 NTU in 2 consecutive recordings 15 minutes apart at the same filter for **3 months in a row**:	• Conduct a filter self-assessment within 14 days. (Systems with 2 filters that monitor CFE must conduct a self-assessment on both filters.)	✍ Report to the State by the 10th of the following month: • Date the self-assessment was triggered; and • Date completed. (If the self-assessment was triggered during the last four days of the month, the system must report within 14 days.)
> 2.0 NTU in 2 consecutive recordings 15 minutes apart at the same filter **for 2 months in a row**:	• Arrange for a comprehensive performance evaluation (CPE) conducted by the State or a State-approved third party within 60 days.	✍ Report to the State by the 10th of the following month: • That the CPE is required; • Date triggered. ✍ Submit a copy of the completed CPE report to the State within 120 days after the exceedance.

* Or CFE for systems with two or fewer filters if continuously monitored.

What are the Disinfection Profiling and Benchmarking Requirements?

If your system is a community or non-transient non-community water system you must:

- ❑ Prior to **July 1, 2003** for systems serving 500-9,999 persons and prior to **January 1, 2004** for systems serving fewer than 500 persons, either:

  - Adequately demonstrate that TTHM levels are less than 0.064 mg/L and HAA5 levels are less than 0.048 mg/L (i.e. less than 80% of the maximum contaminant levels (MCLs) established for these disinfection byproducts in the Stage 1 DBPR). Data must be collected after January 1, 1998 during the month of warmest water temperature and at the point of maximum residence time; OR

  - Develop a **disinfection profile** (available for the State to review during the sanitary survey).

A **disinfection profile** is a determination of *Giardia lamblia* inactivation throughout the treatment plant. Systems using chloramines, ozone, or chlorine dioxide for primary disinfection must also calculate the logs of inactivation for viruses. The disinfection profile is a graphical presentation showing the range of inactivation levels calculated once per week on the same calendar day for one year (the State may approve a more representative data set). It is a tool to help ensure that microbial protection is not jeopardized when making changes in disinfection practices.

- ❑ If your system was required to develop a disinfection profile and is considering a **significant change** to its disinfection practice, your system must submit the following information to the State as part of the consultation and approval process:

  - ✓ A description of the proposed change;
  - ✓ The **disinfection profile** and **disinfection benchmark**;
  - ✓ An analysis of how the proposed change will affect the current levels of disinfection; and
  - ✓ Any additional information requested by the State.

The **disinfection benchmark** is the month with the lowest average of *Giardia lamblia* and/or virus log inactivation calculated from the data used in the disinfection profile and is an indicator of disinfection effectiveness. The benchmark is used by the system, in consultation with the primacy agency to determine if changing disinfection practices would decrease microbial control. The benchmark sets the target disinfection level for alternative disinfection methods.

A **significant change** includes changing the point of disinfection, disinfectant(s) used, disinfection process, or any other modification identified by the State.

WHERE CAN I GET MORE INFORMATION ON THE RULE?

Additional guidance materials specific to LT1ESWTR include:

- **LT1ESWTR Turbidity Guidance Manual (EPA #)**- This manual provides information on the turbidity monitoring and recordkeeping requirements of LT1ESWTR. In addition, tools for compliance with LT1ESWTR are presented, including example worksheets for recording data, information on turbidimeters, information on the filter self-assessment process, example filter profiles, and case studies.

- **Instructional Video for a Filter Self-Assessment** (EPA #) - This video will explain in detail how to perform the filter self-assessment.

- **LT1ESWTR Disinfection Profiling and Benchmarking Guidance Manual** (EPA #)- This manual provides information on the disinfection profiling and benchmarking process. Detailed explanations and examples are presented to assist system operators with performing the disinfection profiling and benchmarking analyses.

- **Instructional Video on How to Perform Disinfection Profiling and Benchmarking (EPA #)**- This video presents examples for calculating log inactivations for both *Giardia* and viruses.

Guidance documents prepared for the IESWTR that also apply to LT1ESWTR include:

- **Alternative Disinfectants and Oxidants Guidance Manual** (EPA 815-R-99-014 /April 1999)
- **M/DBP Simultaneous Compliance Manual** (EPA-815-R-99-015 /August 1999)
- **Guidance Manual for Conducting Sanitary Surveys of Public Water Systems** (EPA 815-R-99-016 /April 1999)
- **Uncovered Finished Water Reservoirs** (EPA 815-R-99-011/ April 1999)

In addition, the following guidance document provides detailed information on Comprehensive Performance Evaluations (CPEs).

- **Optimizing Water Treatment Plant Performance Using the Composite Correction Program** (EPA 625/6-91/027/August 1998)

Or contact EPA's Safe Drinking Water Hotline [800-426-4791] or see the EPA website http://www.epa.gov/safewater/mdbp/lt1eswtr.html.

Fact Sheet: LT1ESWTR Turbidity Provisions for Conventional and Direct Filtration Systems

The Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) establishes more stringent combined filter effluent turbidity limits for conventional and direct filtration systems than those limits established in the Surface Water Treatment Rule. In addition, individual filter turbidity must be continuously monitored. The following turbidity monitoring, reporting, and recordkeeping requirements are just one of several new requirements in the LT1ESWTR.

Is your Public Water Supply Affected?

Your system must comply with the following turbidity monitoring, reporting, and recordkeeping requirements if all of the following apply:

- ✓ It is a surface water system or ground water under the direct influence of surface water system.
- ✓ It serves fewer than 10,000 people.
- ✓ It practices conventional or direct filtration.

When Does Your System Have to Comply?

Your system must start complying with the LT1ESWTR turbidity requirements in this document by January 14, 2005.

What are the Combined Filter Effluent Turbidity Limits for Conventional and Direct Filtration Plants?

Combined filter effluent turbidity must be measured at least every four hours during plant operation.

- ✓ The frequency of monitoring may be reduced for systems serving 500 or fewer people.

The combined filter effluent turbidity must be less than or equal to 0.3 NTU for 95% of the readings taken each month and at no time exceed 1 NTU.

Monthly reports are due to the State by the 10th of the following month and must contain:

- ✓ Total number of combined filter effluent turbidity measurements taken during the month.
- ✓ The number and percentage of combined filter turbidity measurements taken during the month that were less than or equal to your system's required 95th percentile limit of 0.3 NTU.
- ✓ The date and value of any combined filter effluent turbidity measurement taken during the month that exceeded 1 NTU.

As currently required in the Public Notification Rule, the system must notify the State within 24 hours if the combined filter effluent exceeds 1 NTU at any time.

WHAT ARE THE INDIVIDUAL FILTER EFFLUENT TURBIDITY LIMITS FOR CONVENTIONAL AND DIRECT FILTRATION PLANTS?

Because properly functioning filters can mask the poor performance of another filter, the LT1ESWTR also requires continuous monitoring (defined as turbidity values recorded at least every 15 minutes) of individual filters for conventional and direct filtration systems. The combined filter effluent may meet regulatory requirements even though one filter is producing high turbidity water (see Figure 1). One poorly performing filter is capable of passing pathogens, including *Cryptosporidium*. The pathogens can then travel through the remaining treatment plant processes and eventually reach customers, creating a health risk. *Cryptosporidium* is of particular concern because it is very resistant to commonly used disinfectants, such as chlorine, and therefore, must be removed by the treatment process.

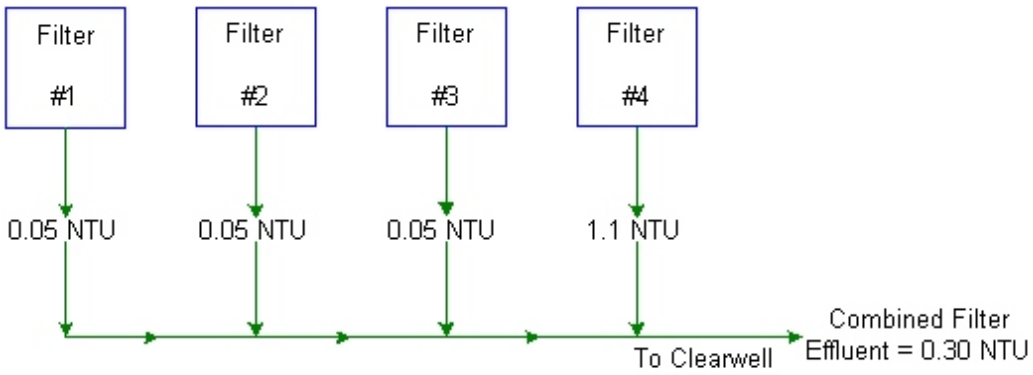


Figure 1. Example of a poorly performing filter (Filter #4) in a conventional or direct filtration plant being masked by properly performing filters (Filters #1, #2, and #3). Note that combined filter effluent turbidity is acceptable (0.3 NTU).

Individual filter turbidity must be continuously monitored and results recorded at least every 15 minutes. Systems that have only two filters may monitor the combined filter effluent (every 15 minutes) in lieu of individual monitoring. If a system has three or more filters, each filter must be monitored individually for turbidity.

- ✓ In the event that the turbidity monitoring equipment fails to take continuous 15-minute readings, the system must conduct 4-hour grab samples until the equipment is replaced/repaired. The system has 14 days to resume continuous monitoring.

- ✓ Monitoring must be conducted using an approved method. Approved methods are EPA Method 180.1, Standard Method 2130B, and Great Lakes Instrument Method 2. Turbidimeters must conform to one of these standards. You can find more information on turbidity sampling in Section II, Chapter 3, of LT1ESWTR Turbidity Provisions manual.

- ✓ Calibration of turbidimeters must be conducted using procedures specified by the manufacturer.

- ✓ Monthly reports are due to the State by the 10th of the following month.

- ✓ Systems must keep records from individual filter monitoring for at least three years.

The following individual filter effluent monitoring information must be reported to the State by the 10th of the following month:

- ✓ Confirmation that your system conducted individual filter effluent turbidity monitoring during the month.
- ✓ Information on individual filter effluent follow-up actions indicated in the table below.

Individual Filter Effluent (IFE) Follow-up Actions		
If the IFE turbidity at the same filter* is:	**Then:**	
> 1.0 NTU in 2 consecutive recordings 15 minutes apart:	✍ Report the filter numbers(s), date(s), turbidity value(s), and cause (if known) to the State by the 10th of the following month.	
If a system has a repeat exceedance:	**Then, in addition to reporting to the State the information regarding the initial exceedance above, the system must:**	
> 1.0 NTU in 2 consecutive recordings 15 minutes apart at the same filter for **3 months in a row**:	• Conduct a filter self-assessment within 14 days. (Systems with 2 filters that monitor Combined Filter Effluent must conduct a self-assessment on both filters.)	✍ Report to the State by the 10th of the following month: • Date the self-assessment was triggered; and • Date completed. (If the self-assessment was triggered during the last four days of the month, the system must report within 14 days.)
> 2.0 NTU in 2 consecutive recordings 15 minutes apart at the same filter for **2 months in a row:**	• Arrange for a comprehensive performance evaluation (CPE) conducted by the State or a State-approved third party within 60 days.	✍ Report to the State by the 10th of the following month: • That the CPE is required; • Date triggered. ✍ Submit a copy of the completed CPE report to the State within 120 days after the exceedance.

* Or combined filter effluent for systems with two or fewer filters if continuously monitored.

WHAT IS A FILTER SELF-ASSESSMENT?

If a system exceeds 1.0 NTU in two consecutive recordings 15 minutes apart at the same filter for three months in a row, the system must conduct a self-assessment of the filter(s) within 14 days of the exceedance occurring in the third month. Systems with 2 filters that monitor combined filter effluent instead of individual filters must conduct a self-assessment on both filters.

The self-assessment must consist of at least the following:

- ✓ Assessment of filter performance;
- ✓ Development of a filter profile;
- ✓ Identification and prioritization of factors limiting filter performance;
- ✓ Assessment of the applicability of corrections;
- ✓ Preparation of a filter self-assessment report;
- ✓ Date self-assessment was triggered; and
- ✓ Date self-assessment was completed.

WHAT IS A CPE?

If a system exceeds 2.0 NTU in two consecutive recordings 15 minutes apart at the same filter for two months in a row, the system must arrange to have a comprehensive performance evaluation (CPE) conducted by the State or a third party approved by the State. The comprehensive performance evaluation is the evaluation phase of the Composite Correction Program (CCP) and is a thorough review and analysis of a facility's design capabilities and associated administrative, operational, and maintenance practices as they relate to achieving optimum performance from the facility.

For further information regarding Comprehensive Performance Evaluations, see the handbook entitled Optimizing Water Treatment Plant Performance Using the Composite Correction Program (EPA, 1998).

WHERE CAN I GET MORE INFORMATION ON THE LT1ESWTR TURBIDITY PROVISIONS?

Additional guidance materials specific to the Turbidity Provisions of LT1ESWTR include:

- **LT1ESWTR Turbidity Provisions Guidance Manual** - This lengthier guidance manual provides more comprehensive information on the rule, data collection, data management, filter self-assessments, and other turbidity-related information. Printed copies may be available from your State office; electronic copies can be downloaded from EPA's website (http://www.epa.gov/safewater/mdbp/lt1eswtr.html). You can also contact the Safe Drinking Water Hotline for a copy at 1-800-426-4791.

- **Instructional Video for a Filter Self-Assessment** - This video will explain in detail how to perform the filter self-assessment.

In addition, the following guidance document provides detailed information on Comprehensive Performance Evaluations (CPEs).

- **Optimizing Water Treatment Plant Performance Using the Composite Correction Program** (EPA 625/6-91/027/August 1998) NCEP info

Or contact EPA's Safe Drinking Water Hotline [800-426-4791] or see the EPA website http://www.epa.gov/safewater/mdbp/lt1eswtr.html.

Fact Sheet: LT1ESWTR Turbidity Provisions for Slow Sand, Diatomaceous Earth, and Alternative Filtration Systems

The Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) establishes combined filter effluent turbidity requirements for alternative filtration systems. Alternative filtration systems are defined as those systems using a filtration technology other than direct, conventional, slow sand or diatomaceous earth filtration. The LT1ESWTR did not modify the combined filter effluent turbidity requirements for slow sand and diatomaceous earth filters as established in the Surface Water Treatment Rule. The following turbidity monitoring, reporting, and recordkeeping requirements are just one of several new requirements in the LT1ESWTR.

Is your Public Water System Affected?

Your system must comply with the following turbidity monitoring, reporting, and recordkeeping requirements if all of the following apply:

- ✓ It is a surface water system or ground water under the direct influence of surface water system.
- ✓ It serves fewer than 10,000 people.
- ✓ It practices slow sand, diatomaceous earth, or alternative filtration.

What are the Turbidity Limits for Slow Sand and Diatomaceous Earth Filters?

The turbidity standards for slow sand and diatomaceous earth filters did not change from the requirements in the Surface Water Treatment Rule. These technologies accomplish 2-log Cryptosporidium removal with the turbidity limits set in the Surface Water Treatment Rule.

The combined filter effluent must meet the following requirements:

- ✓ The combined filter effluent turbidity must be monitored at least every 4 hours and must be less than or equal to 1 NTU for 95% of the readings taken each month. If the combined filter effluent turbidity exceeds 1 NTU, the system must record the date and turbidity value on its monthly report.
    - ✓ The frequency of monitoring may be reduced for slow sand systems of any size.
    - ✓ The frequency of monitoring may be reduced for systems using diatomaceous earth and serving 500 or fewer people.
- ✓ At no time can the turbidity levels exceed 5 NTU. A system that exceeds 5 NTU must notify the State by the end of the next business day.
- ✓ Turbidity readings are due to the State by the 10th of the following month.

Although there are no individual filter effluent turbidity monitoring requirements for slow sand and diatomaceous earth filters, individual filter monitoring may help identify problems with an individual filter that could be masked when blended with filtered effluent from properly performing filter.

WHAT IF MY SYSTEM USES AN ALTERNATIVE FILTRATION TECHNOLOGY?

Alternative filtration technologies are defined as technologies other than conventional, direct, slow sand, and diatomaceous earth filtration. Alternative filtration technologies, such as cartridges, bags, or membranes, must demonstrate (using pilot plant studies or other means) to the State that they meet the following requirements through a combination of filtration and disinfection:

- ✓ 2-log (99%) removal of Cryptosporidium
- ✓ 3-log (99.9%) removal and/or inactivation of Giardia
- ✓ 4-log (99.99%) removal and/or inactivation of viruses

The State will establish the turbidity limits for the system based on the technology's demonstrated performance and will determine the frequency of turbidity measurements. The minimum frequency for measuring turbidity is at least every 4 hours unless reduced by the State. The maximum turbidity limits allowed are:

- ✓ 95 percent of the monthly readings must be less than or equal to 1 NTU.
- ✓ The system cannot exceed 5 NTU at any time.

Turbidity readings are due to the State by the 10th of the following month. A system that uses an alternative technology must meet State-established turbidity limits by January 14, 2005.

WHERE CAN I GET MORE INFORMATION ON THE LT1ESWTR TURBIDITY PROVISIONS?

Additional guidance materials specific to the turbidity provisions of LT1ESWTR include:

- **LT1ESWTR Turbidity Provisions Guidance Manual -** This lengthier guidance manual provides more comprehensive information on the rule, data collection, data management, filter self-assessments, and other turbidity-related information. Printed copies are available from your State office; electronic copies can be downloaded from EPA's website (http://www.epa.gov/safewater/mdbp/lt1eswtr.html). You can also contact the Safe Drinking Water Hotline for a copy at 1-800-426-4791.

Fact Sheet: Disinfection Profiling and Benchmarking for LT1ESWTR

The Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) was finalized January 14, 2002. Among other provisions, it requires certain public water systems to evaluate their disinfection practices through disinfection profiling and benchmarking.

IS YOUR PUBLIC WATER SYSTEM REQUIRED TO DO DISINFECTION PROFILING AND BENCHMARKING?

Your system is affected by the disinfection profiling and benchmarking requirements under the LT1ESWTR if it meets all three of the following:

- ❑ Surface water or ground water under the direct influence of surface water (GWUDI);
- ❑ A community or non-transient non-community water system; **AND**
- ❑ Serves fewer than 10,000 people.

WHEN MUST YOUR PUBLIC WATER SYSTEM BEGIN DISINFECTION PROFILING?

Your system must begin one year of disinfection profiling, as discussed on page 3, no later than:

- ❑ July 1, 2003 for systems serving 500-9,999 people **OR**
- ❑ January 1, 2004 for systems serving fewer than 500 persons.

ARE THERE ANY ALTERNATIVES TO DISINFECTION PROFILING?

Yes, your State may determine that you do not have to develop a disinfection profile if you provide the following information on disinfection byproducts:

- ❑ You collect a total trihalomethane (TTHM) sample and your result is less than 0.064 mg/L **AND**
- ❑ You collect a five haloacetic acid (HAA5) sample and your result is less than 0.048 mg/L.

However, these samples must be collected in the **month of warmest water temperature in the distribution system** BEFORE:

- ❑ July 1, 2003 for systems serving 500 to 9,999 people **OR**
- ❑ January 1, 2004 for systems serving fewer than 500 people **BUT**

If you already have data on TTHM and HAA5 in the month of warmest water temperature and at maximum residence time, both samples must have been collected after January 1, 1998.

NOTE: Both your TTHM and HAA5 samples must be collected at the point where the water remains in the distribution system the longest, known as the "***Maximum Residence Time***."

EXAMPLES: ALTERNATIVES TO DISINFECTION PROFILING UNDER THE LT1ESWTR

Example 1: SYSTEM SERVES BETWEEN 500 and 9,999 PEOPLE

Background Information:

- You are a community or non-transient, non-community surface water system serving **1,000 people**.
- Based on historical data, the month of warmest water temperature in your distribution system is **August**.

LT1ESWTR Requirements:

- For systems serving **between 500 and 9,999** people, a disinfection profile must begin by **July 1, 2003.**
- A State may determine that a disinfection profile is unnecessary if the system shows that TTHM levels are below 0.064 mg/L and HAA5 levels are below 0.048 mg/L during the month of warmest water temperature and at the maximum residence time. If you are using grandfathered data, samples must have been collected after January 1, 1998.

Monitoring Option:

Since your month of warmest water temperature is in August, your system's only opportunity to collect TTHM and HAA5 samples before the **July 1, 2003** disinfection profiling compliance date is in **August 2002.** Therefore, if you would like to see whether your TTHM and HAA5 samples are low enough, you must collect TTHM and HAA5 samples in August 2002, at the maximum residence time and submit the results to your State. If your samples indicate that your TTHM level is below 0.064 mg/L and your HAA5 level is below 0.048 mg/L, then your State may determine that a disinfection profile is unnecessary. If your State determines that they would still like your system to develop a disinfection profile, then you must begin disinfection profiling by July 1, 2003.

Example 2: SYSTEM SERVES FEWER THAN 500 PEOPLE

Background Information:

- You are a community or non-transient, non-community surface water system serving **100 people**.
- Based on historical data, the month of warmest water temperature in your distribution system is **June**.

LT1ESWTR Requirements:

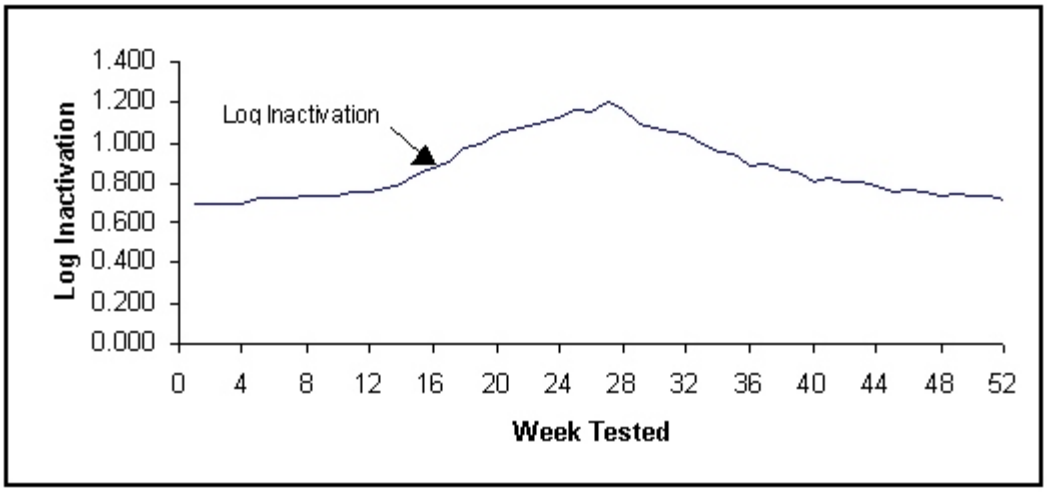
- For systems serving **fewer than 500 people**, a disinfection profile must begin by **January 1, 2004.**
- A State may determine that a disinfection profile is unnecessary if the system shows that TTHM levels are below 0.064 mg/L and HAA5 levels are below 0.048 mg/L during the month of warmest water temperature and at the maximum residence time. If you are using grandfathered data, samples must have been collected after January 1, 1998.

Monitoring Option:

Since your month of warmest water temperature is in June, your system has the opportunity to collect TTHM and HAA5 samples before the **January 1, 2004** disinfection profiling compliance date in **June 2002 or June 2003.** Therefore, if you would like to see whether your TTHM and HAA5 samples are low enough, you must collect TTHM and HAA5 samples in June 2002 or June 2003, at the maximum residence time and submit the results to your State. If your samples indicate that your TTHM level is below 0.064 mg/L and your HAA5 level is below 0.048 mg/L, then your State may determine that a disinfection profile is unnecessary. If your State determines that they would still like your system to develop a disinfection profile, then you must begin disinfection profiling by January 1, 2004.

What is a Disinfection Profile?

A disinfection profile provides a description of your system's disinfection practices. It is a graphical presentation of your system's level of inactivation for Giardia lamblia (and viruses if your system uses chloramines, ozone or chlorine dioxide for primary disinfection) each week for a period of one year. The disinfection profile does not need to be submitted. However, it must be available for review by the State during a sanitary survey.



Example of Disinfection Profile

How is a Disinfection Profile developed?

Inactivation values for the disinfection profile are calculated from operational data, on the same day each week, over the course of one year using the Surface Water Treatment Rule CT Tables.

The following data used for CT calculations must be collected during peak hourly flow:

- The disinfectant residual concentration ("C", in mg/L) collected before or at the first customer and prior to each additional point of disinfection in the distribution system;
- Contact time ("T", in minutes); **AND**
- Data collected at each residual disinfectant concentration sampling point:
  - Water temperature (in degrees Celsius) and
  - pH (only for systems using chlorine)

☞ **An electronic spreadsheet to assist systems in calculating CT values is posted on the EPA website at http://www.epa.gov/safewater/mdbp/lt1eswtr.html. In addition, contact EPA's Safe Drinking Water Hotline [800-426-4791] for further information.**

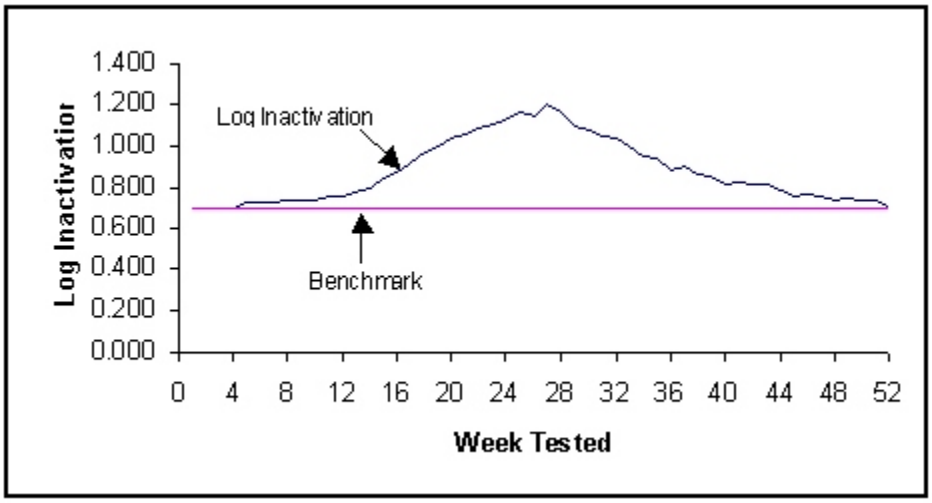
Who must Determine a Disinfection Benchmark?

A disinfection benchmark must be determined by your system if:

- ❑ You had to develop a disinfection profile **AND**
- ❑ You are considering making a significant change to your disinfection practice which includes any of the following:
  - Changes to the point of disinfection;
  - Changes to the disinfectant(s) used in the treatment plant;
  - Changes to the disinfection process; OR
  - Any other change identified by the State.

What is a Disinfection Benchmark?

A disinfection benchmark provides the information necessary to understand if any significant change to current disinfection practice will decrease microbial inactivation (i.e., pathogens killed by disinfection). It is the calculation of the lowest monthly average of inactivation, using the data collected for the disinfection profile. It is used as a reference point for discussions between the system and the State to evaluate proposed disinfection practice changes.



Example of Disinfection Profile with Benchmark

What must my system do if we are considering a significant change to disinfection practices?

Your system must consult with the State for approval and submit the following information to the State:

- ✓ A description of the proposed change;
- ✓ The disinfection profile and benchmark;
- ✓ An analysis of how the proposed change will affect the current levels of disinfection; and
- ✓ Any additional information requested by the State.

Where can I get more Information On Disinfection Profiling and Benchmarking?

- **LT1ESWTR Disinfection Profiling and Benchmarking Guidance Manual -** This manual provides information on the disinfection profiling and benchmarking process. Detailed explanations and examples will be presented to assist system operators with performing the disinfection profiling and benchmarking analyses. [EPA Document #]

- **Instructional Video on How to Perform Disinfection Profiling and Benchmarking-** This video presents examples of calculating log inactivations for Giardia and viruses. [EPA Document #]

Please contact the Safe Drinking Water Hotline at 1-800-426-4791 or visit http://www.epa.gov/safewater/mdbp/lt1eswtr.html to obtain the documents above or for further information.

PLEASE LOOK INSIDE:

Your water system is expected to be affected by the requirements of the new Long Term 1 Enhanced Surface Water Treatment Rule.

However-- look inside to see how you may be able to reduce your workload by planning ahead!

More information can be obtained from:

- ✏ The EPA Safe Drinking Water Hotline, Telephone: 1-800-426-4791
- ✏ http://www.epa.gov/safewater/mdbp/lt1eswtr.html
- ✏ Your State's primacy agency

Checklist:

Disinfection Profiling for the LT1ESWTR

In 1989, EPA published the Surface Water Treatment Rule to control microbial pathogens in drinking water. On January 14, 2002, EPA finalized the Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) to improve control of microbial pathogens. Among other provisions, it requires certain public water systems to evaluate their disinfection practices (through a process called disinfection profiling). The purpose of disinfection profiling is to help ensure there is not a reduction in microbial protection if changes are made to disinfection practices to comply with new maximum contaminant levels established by the December 1998 Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR).

This checklist will step you through the disinfection profiling requirements to help you determine what activities you must conduct and when the activity must be completed.

PART 1: System Type

Please answer the following questions to see if your system is subject to the disinfection profiling requirement.	YES	NO
1.) Does your system use surface water or ground water under the direct influence of surface water (GWUDI)?	❑	❑
2.) Is your system a community or non-transient non-community water system?	❑	❑
3.) Does your system serve fewer than 10,000 people?	❑	❑

☞ If you answered **NO** to one or more questions, this fact sheet does not apply to you.

☞ If you answered **YES** to all three questions in Part 1, please go to Part 2. You are subject to the disinfection profiling and benchmarking requirements unless your State determines that you have acceptable data on disinfection byproducts.

PART 2: Disinfection Byproduct (DBP) Sampling

Systems that can demonstrate low DBP levels are less likely to make a change in disinfection practices to meet the Stage 1 DBPR requirements, and therefore may not have to create a disinfection profile.

Please answer the following questions to see if your data qualifies.	YES	NO
4.) Have you collected a sample for total trihalomethanes (TTHM) and five haloacetic acids (HAA5) after January 1, 1998 ?	❑	❑

✍ If you answered **NO** to question 4, go to Part 3.

PART 2: Disinfection Byproduct Sampling *(Continued)*

	YES	NO
5.) Let's look at your TTHM data		
a.) Was the TTHM sample collected during the month of warmest water temperature?	❑	❑
b.) Was the TTHM sample collected at a point where the water has remained in the distribution system for the longest time (i.e. maximum residence time)?	❑	❑
c.) Was the TTHM sample result less than 0.064 mg/L?	❑	❑
6.) Let's look at your HAA5 data:		
a.) Was the HAA5 sample collected during the month of warmest water temperature?	❑	❑
b.) Was the HAA5 sample collected at a point where the water has remained in the distribution system for the longest time (i.e. maximum residence time)?	❑	❑
c.) Was the HAA5 sample result less than 0.048 mg/L?	❑	❑

✍ If you answered **NO** to one or more questions in Part 2, go to Part 3.

✍ If you answered **YES** to all the questions in Part 2, your State may determine you do not

PART 3: Your Options.

If you have gotten to Part 3, you are subject to the disinfection profiling requirement because you do not have TTHM and HAA5 data or the data you have does not meet all the requirements outlined in Part 2.

Please read the following options and decide what option is best for your system.

❑ OPTION 1 – Plan to collect TTHM and HAA5 samples this summer (i.e. month of warmest water temperature). Collect one TTHM sample and one HAA5 sample in your distribution system where the water remains the longest (maximum residence time) during the month of warmest water temperature.

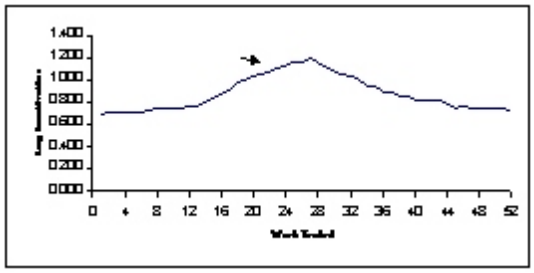
✍ If your TTHM sample result is less than 0.064 mg/L and your HAA5 sample result is less than 0.048 mg/L, your State may determine you do not have to develop a disinfection profile. Please contact your State agency.

✍ If you are at or above these levels go to Part 4.

❑ OPTION 2 – Go straight into disinfection profiling. Disinfection profiling consists of determining your system's level of inactivation once a week for one year. See Part 4 for more detail.

Part 4: Disinfection Profile - What you need to know

What is a Disinfection Profile?



A disinfection profile provides a description of your system's disinfection practices. It is a graphical representation of your system's level of inactivation for *Giardia lamblia* each week for a period of one year. If your system uses chloramines, ozone or chlorine dioxide for primary disinfection, you must also calculate inactivation of viruses. The disinfection profile does not need to be submitted to the State. However, it must be available for review during a sanitary survey.

How is a Disinfection Profile developed? What Data Needs to be Collected?

Inactivation values for the disinfection profile are calculated from operational data collected on the same day each week, over the course of one year.

The following data used for inactivation calculations must be collected during peak hourly flow:

- **Data Collected at each sampling location**
  - Disinfectant residual concentration ("C", in mg/L),
  - Contact time ("T", in minutes),
  - Water temperature (in degrees Celsius) and
  - pH (only for systems using chlorine).
- **Sampling locations**
  - Before or at the first customer
  - Prior to each additional point of disinfection

✍ An electronic spreadsheet that calculates inactivation values is posted on the EPA website at *http://www.epa.gov/safewater/mdbp/lt1eswtr.html.*

✍ More detailed information on how to create a disinfection profile is available in EPA's LT1ESWTR Profiling and Benchmarking Guidance Manual which is posted on the EPA website at *http://www.epa.gov/safewater/mdbp/lt1eswtr.html.*

When do I Begin Collecting Data for My Disinfection Profile?

If your system serves...	Begin your disinfection profile by...
500 to 9,999 people	July 1, 2003
fewer than 500 people	January 1, 2004

Are You Considering Making a Change to Your Disinfection Practices?

☞ If you are thinking about making a change to your disinfection practices, you must consult with your State prior to making any changes.

Please contact the Safe Drinking Water Hotline at 1-800-426-4791 or visit http://www.epa.gov/safewater/mdbp/lt1eswtr.html for more information.

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PLEASE LOOK INSIDE

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